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ABORIGINAL SHELL-HEAPS OF THE MIDDLE ATLANTIC TIDEWATER REGION

By W. H. HOLMES

THE DEPOSITS AND THEIR CONTENTS

Artificial shell deposits are an important feature of the aboriginal remains of both Americas. They are the kitchen-middens of mollusk-consuming peoples, and are found along the seashore and on the banks of lakes and rivers wherever mulluscan forms of life abound. Analogous deposits occur on all dwelling and other sites where food was consumed. The contents of the deposits vary with the nature of the food supply. Oysters, clams, mussels, and numerous varieties of univalves yield a very large percentage of compact and durable refuse, and where their utilization was most extensive the middens are often of surprising magnitude.

These deposits of shells are sometimes spoken of as mounds, but they are rarely to be considered as works of art in the sense that their conformation is the result of design. The accumulating refuse generally increased the habitability of the sites, and distribution of the shells was no doubt in cases intelligently supervised with this end in view. It further appears that actual building sometimes took place, that shape was modified and height was increased for domiciliary and defensive purposes, and when the sites became places of sepulture the shells were utilized in building mounds. It is not, however, as works of art that these deposits are to be considered in this place — their use as constructions being a secondary consideration — but as accumulations of refuse inclosing in their mass reliable records of the food supply, the arts and industries, and, in a measure, the habits and customs of the people.

The dimensions of the accumulations are so remarkable that early observers were loth to admit their artificial origin. In some cases they cover areas twenty or even thirty acres in extent. On the shores of some of the Atlantic bays and rivers deposits are practically continuous for many miles and reach back from the water

for distances varying from a few rods to half a mile or more, according to the nature of the ground. It is estimated that in the Maryland-Virginia area alone the oyster-shell deposits cover upward of one hundred thousand acres. The deposits are heaviest where favorable dwelling sites occur near prolific shallows or bars; it is not exceptional to find them from ten to twenty feet deep, and a depth of thirty feet has been reported in some localities. The shells in decomposing yield a dark rich soil, and where decay is well advanced the shell fields are exceedingly fertile. On many sites in recent years the shells have been calcined in kilns and employed as fertilizer. At Popes Creek, Maryland, a single midden has yielded upward of 500,000 cubic feet of oyster shells for this purpose. They are also extensively employed in some sections in building roads and in paving streets.

In the main, the shell banks along the middle and northern Atlantic coast are so nearly homogeneous throughout their mass as to be regarded as representing a rather limited and not seriously interrupted period of occupancy, but the condition and extent of numerous examples farther south, and especially in Florida, suggest great age. The growth on them of live-oaks of the largest size proves that the deposits reached their present dimensions long before the discovery of America. It is also noted that in some cases the lower beds are in an advanced stage of decay, and, again, that they have become consolidated and that the bones imbedded in them have in great measure lost their animal matter — conditions indicating considerable age. The lapse of many centuries is also suggested by changes in the river courses and the extensive erosion of bluffs since the period of midden accumulation, as well as by changes in some of the molluscan forms of life, new varieties having arisen during the period of occupancy. It is noted also that cultural changes have taken place since man first occupied the sites, that in cases the artifacts of the lower layers are less plentiful and less highly specialized than in the upper, and that pottery is absent in the older strata and plentiful near the surface. Observations, however, bearing on the question of antiquity are as yet rather meager and fragmentary, and cannot be implicitly relied on. The cultural changes, for example, may be due largely to changes in

the tribes represented rather than to progress in the culture of a single people.

In some sections, especially on the seashore, the tribes resorted to the fisheries at stated seasons only, and in such cases the relics left do not fully represent the art of the people. The utensils and implements were to a large extent prepared for temporary and local use, and are exceptionally rude. However, as we pass along the coast from Maine to Mexico the artificial contents of the shell banks of each section represent somewhat fully the characteristic handicraft of the adjacent interior region ; for example, rude cord-marked pottery is found in the northern middens, stamped ware in the southern, and painted ware in those of the Gulf states.

The Atlantic coastal belt from Carolina to Maine was in colonial times occupied by tribes of Algonquian stock, and the art remains are fairly homogeneous throughout, exhibiting characters not inconsistent with the theory that these simple people had sole possession of the soil for an indefinitely long period. The Iroquoian tribes more decidedly than any other inland people encroached upon the Algonquian areas, and in New York and New Jersey vestiges of their art extend down to the sea. The same is true of the Carolinas, where the southern Iroquoian tribes — the Tuscarora and the Cherokee — were dominant at the coming of the English. Notwithstanding these encroachments upon the coastal tribes, the shell-heaps and their contents may safely be regarded as almost wholly Algonquian.

The various Algonquian tribes of colonial days are known to us only through meager references by the colonists and occasional mention by writers of later date. The merest remnants of these peoples have come within the observation of scientific men of the last half of the nineteenth century and of the present decade. The Roanoke colony (1584–1587) came in contact with the Secotan, the Weapemeoc, the Chowanock, and other groups occupying the region between Chesapeake bay and Pamlico sound ; the Jamestown colony, with the Powhatan, the Nanticoke, and the Conoy or Piscatawa ; the Pennsylvania colony, with the Delawares ; and the New Jersey-New York colonies, with the Delawares and Mohican. Many of the best known shell-heap sites of today were the village

sites of these tribes, so that the archeology of the region connects definitely with colonial history, giving an exceptional interest to our investigations.

POPES CREEK SHELL-HEAPS

It is not possible to describe all of the shell-heaps of these tidewater shores, but the general characteristics of all are so simple and uniform that the

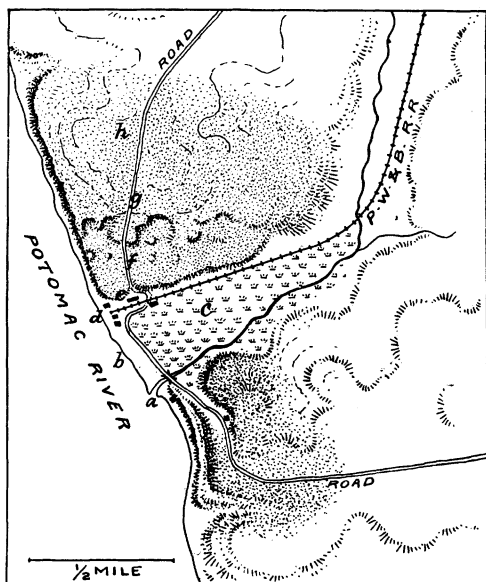


FIG. 8. — Map of Pope's Creek; the dotted areas represent the shell beds. *a*, Mouth of creek. *b*, Bar separating the marsh (*c*) from the river. *d*, Railway station. *e*, Kiln for calcining shells. *f*, Lower terrace, with shell bed partly removed. *g*, Slope to upper level. *h*, Main plateau.

study of a single example will answer the main purposes of the present writing. The Popes Creek beds may well be chosen for this special examination, as they are among the most extensive deposits in the Potomac-Chesapeake region, thus serving as a type. They have also the great advantage to the student of having been extensively dissected by lime-burners.

Popes creek enters the Potomac from the Maryland side about 60 miles below Washington and 40 miles above the mouth of the river. At

the mouth of this creek, on the north side, stands the small station which marks the southern terminus of the Pennsylvania Railroad. The only other buildings (1890) in the vicinity are a cottage, set against the slopes on the south side, and occasional farm houses distributed over the surface of the upland. The small stream descends from the plateau on the northeast, and, like many other small tributaries of the Potomac, widens near its mouth into an inlet. This is about a thousand feet wide on the river front

and extends back to the north a mile or more. Today this inlet is hardly more than a marsh — a brackish water meadow — through which the creek makes a tedious passage before entering the river at the southern end of the narrow sand-bar that encloses the marsh (figs. 8 and 9). Many years ago this inlet was a sheet of water deep enough for the accommodation of vessels of large size.

North of the creek is a bold spur of the plateau which descends by steep rounded slopes to the creek on one side and falls off to the river in a sheer cliff, from 50 to 100 feet in height, on the other.

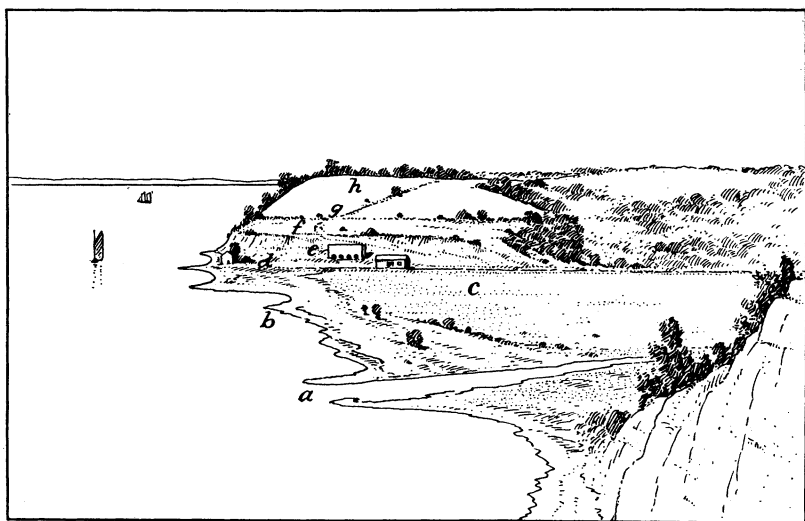


FIG. 9. — View of Popes Creek, looking north. *a*, Mouth of creek. *b*, Bar separating the marsh (*c*) from the river. *d*, Railway station. *e*, Kiln for calcining shells. *f*, Lower terrace, with shell bed partly removed. *g*, Slope to upper level. *h*, Main plateau.

South of the inlet the bluffs also rise in rounded contours from the creek, and on the river front extend to the south in a series of nearly vertical walls.

Popes Creek is not mentioned as a native village site in the writings of Smith or of any of the colonists who followed him. The nearest Indian village recorded by Smith was Potapaco, corrupted later into Port Tobacco, about eight miles to the north. It is probable that the tribe which occupied this site, at least in late pre-colonial and colonial times, was the Yoacomico, the chief seat of

which was probably on St Mary's river. In more recent times the Indians of the general region came to be known as Piscataways, the last remnant of which moved northward into the valley of the Susquehanna about the year 1700. It is claimed that Indian blood still flows in the veins of some of the present inhabitants of this section of the Potomac. The shell-heaps are first mentioned in scientific literature by Dr Elmer R. Reynolds.¹

The first kiln established on this site for calcining the oyster shells for fertilizing purposes was owned by Mr William D. Merrick. It was situated at the base of the low terrace which forms the outer extremity of the northern spur. The railway station was erected about 1870, and a portion of the point of the shell-covered terrace was removed and the site leveled off for the buildings. The shells and earth were used for filling at the point where the road crosses the northern edge of the marsh. About the year 1881 new furnaces were built under the edge of the bank by Messrs Howard & Della, and the burning of the shells was carried on quite extensively for a number of years. The deposits have been almost completely removed from a space of about three acres on the terrace, as shown in the sketch map (fig. 10. See also plate VIII, *a*). On the south side of the creek also the shells have been utilized to a considerable extent.

It is apparent that the ancient oystermen collected the bivalves from the submerged bars about the mouth of the creek and carried them up the slopes to their dwellings or feasting places, which were situated on the comparatively level spots and, more especially, on the lower terrace, where the heaviest deposits of shells were found (figs. 8 and 9, *f*). It is stated on the authority of residents of the neighborhood that, at the outer margin of the terrace, the shells had accumulated to a depth of nearly twenty feet. The greatest depth observed in the portions that now remain is about five feet, the average depth over the whole area being estimated at six feet. This terrace is thirty-five to forty feet in height and has a superficial area of about four acres. The surface rises gently to the north, connecting with the ridge leading up to the plateau level (figs. 8

¹ *Abstract of Transactions of the Anthropological Society of Washington, 1879-81, p. 23, Washington, 1881.*



a. General View Showing Progress of Removal of Shells, and Lodge-site Remnants.



b. Heavy Deposit Showing Pockets of Decayed Shells Beneath.

and 9, *g*). Ascending this ridge, it is found that the shells thin out gradually to four and then to two feet or less. Over limited areas on the summit the deposits increase in thickness, but half a

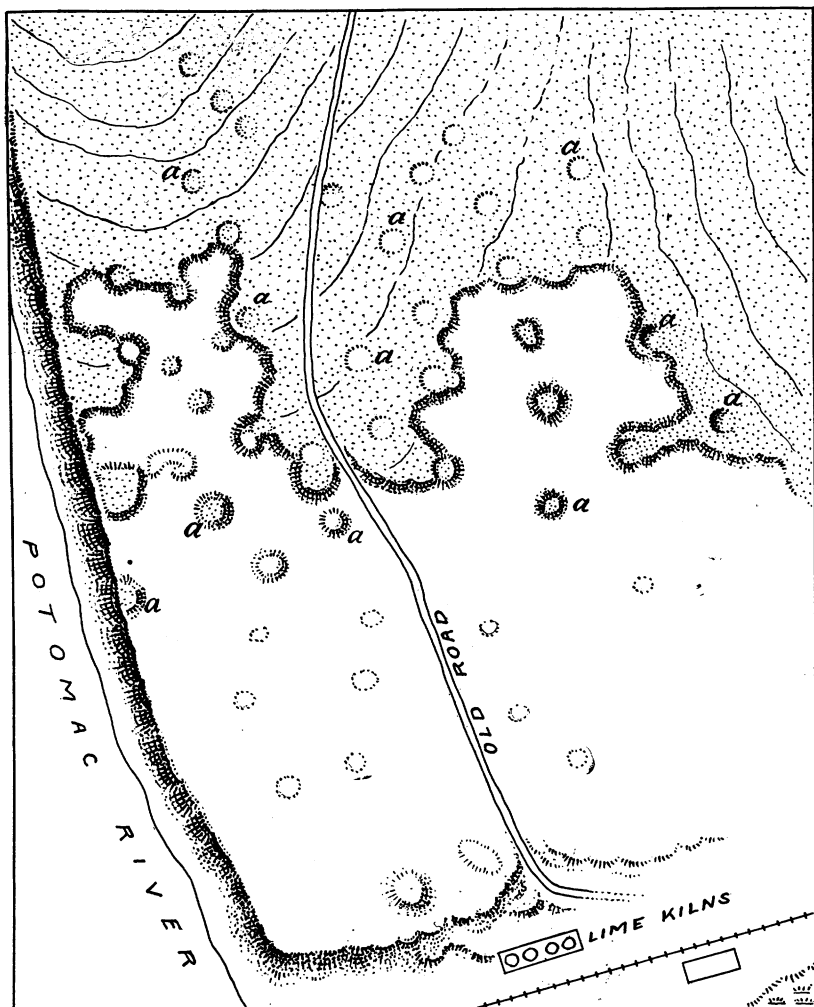


FIG. 10.— Sketch map of the outer terrace, showing the areas from which the shells have been removed. *a, a*, Old lodge sites.

mile back they are scattered thinly over the fields, numerous heavier clusters marking lodge sites. On the river front the tides and

currents have encroached upon the original slope of the promontory (figs. 8 and 9, *i*), leaving an almost vertical cliff reaching the full height of the lower terrace and extending in places to the summit of the plateau. Along the crest of this cliff a section of the shell deposits is exposed, affording an excellent opportunity for study.

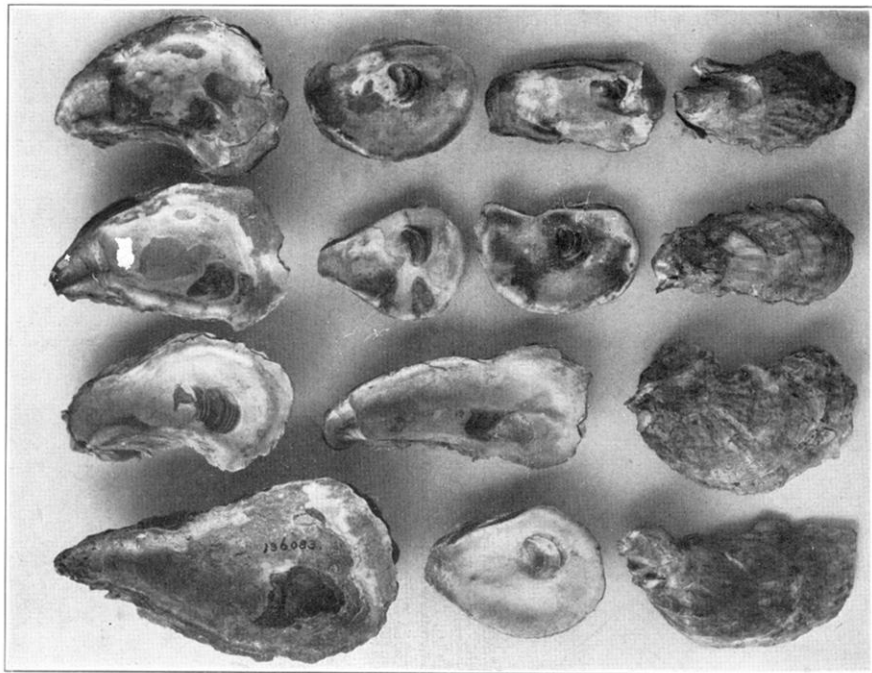
On the south side of the creek the main deposit of shells occupies the margin of the nearly level plateau, some one hundred to one hundred and twenty feet in elevation. This mass of shells was not examined in detail, as it was under cultivation, but the deposit is several feet in thickness on the side next the creek. The area covered is hardly less than twenty acres. The edge of the plateau bordering the river front is not covered to any considerable thickness, and the narrow spur extending down to the mouth of the creek is almost without shells, a fact indicating clearly that, even at the time of aboriginal occupancy, this ridge was already too narrow to accommodate dwellings. The oyster gatherers have occupied two or three of the less steep portions of the slope toward the creek, and the accumulations have reached as much as five feet in thickness. The shells have been to some extent removed from these spots for burning.

The shell-deposit sites were necessarily to some extent dwelling or village sites, but it is believed that in many cases they were not the principal or permanent habitations of the people who occupied them. The communities concerned in the oyster fisheries of Popes Creek may have spent the summer farther inland, and the winter and spring months, during which the oyster is available, may have been spent here. Howsoever this may have been, the evidence of actual residence on this site may be seen on every hand, and the deposits of refuse are so extensive and the remains of articles of art so numerous, that this must be considered one of the most important aboriginal stations in the tidewater region.

One of the most striking features of this site is the presence of a large number of shallow depressions distributed over the shell surface, manifestly marking the sites of lodges. These depressions are not more than a foot or two in depth and are fifteen to thirty feet in diameter. They are approximately circular and arranged in



a. Deposit, Six Feet in Depth, of Well-preserved Shells.



b. Prevailing State of Preservation of the Shells; About One-half Actual Size.

somewhat symmetric order, and are from twenty-five to sixty feet apart from center to center. According to Mr Theodore Stone, a resident of the neighborhood, the most important line of these sites, now nearly obliterated, extended from the point near where the railway station stands, across the middle portion of the lower terrace, and thence up to the highest part of the promontory. Other less regularly arranged lines were observed on the right and left of this. Mr L. M. Della was of the opinion that the house depressions were arranged in intersecting rows and with considerable regularity. When Howard & Della came to remove the shells for burning, it was found that the deposits were very impure within the area of these ancient depressions and of little value for the manufacture of fertilizer. The spaces between the depressions, however, were composed of comparatively pure shells, so that, as the work went on, the impure spots beneath the dwelling sites were left, and now in several instances stand as islands four to six feet in height (pl. VIII, *a*). On the map (fig. 10) some thirty sites are marked, and it appears that there was really little regularity in the disposition of the lodges. Rows can be made out, but the ground was so uneven over the portion of the bed still preserved that alignment would have been difficult. These depressions in the spring of 1891 were rendered more than usually distinct to the observer by the growth of weeds and grass, which filled them, contrasting strongly with the white shell surface surrounding them, which was too firm to encourage vegetation. The study of these ancient house sites is facilitated by the sections made by the lime-burners, as seen in the many vertical faces of the deposit thus exposed (pl. VIII, *a*). The portions beneath the lodges are often dark and impure, and the layers indicate successive occupancy probably extending over a considerable period. The conditions are shown in the section (fig. 11).

The surface stratum (about ten inches in thickness) is that part of the deposit disturbed by the plow. Beneath are the midden deposits, which have remained without disturbance since the period of aboriginal occupancy. Within the lodge pockets the shells are much blackened with vegetable matter and kitchen refuse. With the shells, and especially with the darker refuse, are many stone implements, burned and broken stones, pottery, bones of animals,

antlers of deer, etc. The shells between the lodge depressions, as seen at the right and left in the section, are comparatively free from other classes of refuse and of artifacts (pl. ix, *a*). The valves of the shells are usually separated, but are rarely broken (pl. ix, *b*), a con-

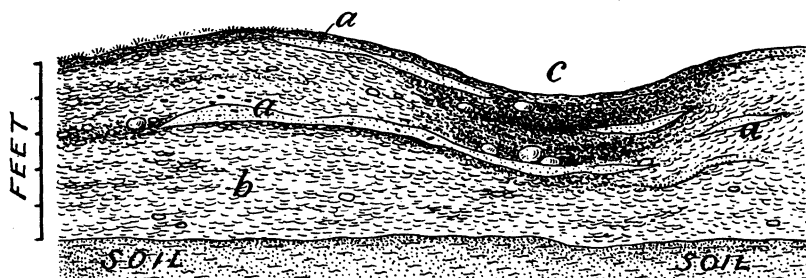


FIG. 11. — Section of deposits and lodge site. (*a, a*, Fire beds, layers of ashes and calcined shells. *b*, Pure shells. *c*, Lodge depression.)

dition making it practically certain that the oysters were roasted or steamed and not broken open with knives or hammers.

The manner of conducting the dredging work can readily be surmised. It is probable that here, as elsewhere, the oysters occurred on bars so shallow that at low tide they could be detached

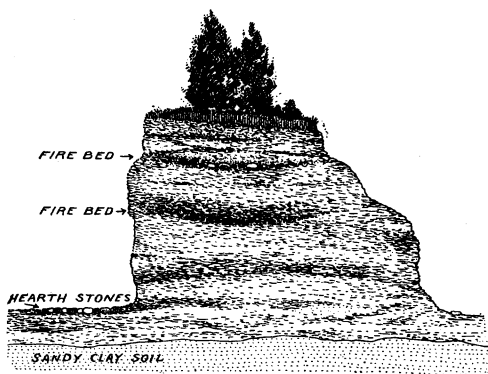


FIG. 12. — Hearth of boulders near base of shell deposits.

and gathered without difficulty or inconvenience. Diving was no doubt resorted to on occasion, and it is fair to assume that the inventive genius of the Indian was equal to the task of contriving some device by means of which dredging could be carried on from boats in the deeper waters. One of the drawings of John White, artist of the Roanoke colony, now preserved in the British Museum, shows a fishing party in a dugout canoe, and one of the men is depicted as using a long-handled utensil that suggests a rake, although

one of the drawings of John White, artist of the Roanoke colony, now preserved in the British Museum, shows a fishing party in a dugout canoe, and one of the men is depicted as using a long-handled utensil that suggests a rake, although

it is possible that it was intended for a fish spear. On landing, the oysters were transported to the various feasting sites and lodges by means of skins, bags, or baskets, and we can readily picture the animated scenes that followed: the gathering of families and clans, the preparation of baking hearths (fig. 12) and steaming pits, the stone boiling in earthen pots, the feasting, and, on occasion, the music and dancing. On this site, beside the oyster industry, were carried on the various arts and customs of a primitive community: the gathering of stones and the shaping of stone tools, the making of weapons, the preparation of clay and the building and baking of rude caldrons; the spinning of thread and the weaving of coarse cloths, the making of nets and baskets, the dressing of skins, and the drying of meat, fish, and oysters; the carving of canoes, the building of lodges, the setting of fish weirs, and the planting of corn on favorable spots in the vicinity; the preparation for war and the chase, the mummeries of the medicine-men, the torture of victims, the wailing for the dead, and the strange ceremonies connected with burial.

Of the multitude of tools and utensils used by the inhabitants of this site, only those made of the most durable materials now remain. Objects of stone are especially plentiful, and although they present some local peculiarities, they are analogous in every essential with the stone implements of all other sites of the general region. The various classes of objects obtained may be enumerated as follows: Hearth stones, boiling stones, mortars, pestles, pitted stones, hammer-stones, bone-crushers, grooved axes, notched axes, celts, knives, arrow and spear heads, scrapers, drills, awls, net-sinkers, pottery, pipes, ornaments, and various forms of rejectage of manufacture.

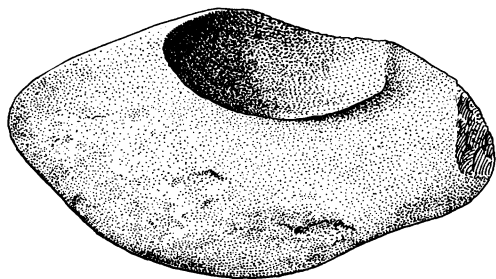


FIG. 13. — Mortar made of a large boulder.

Numerous rude shallow mortars are found. They are, as a rule,

flattish boulders or masses of rock, having originally a concave or flat side which has been utilized for grinding, or like forms that have been excavated sufficiently to adapt them to their purpose. A type specimen is given in figure 13. Another example, shown in fig. 14, is noteworthy in having been shaped about the periphery and base by flaking.



FIG. 14. — Shallow mortar with chipped under-surface.

The pestle or muller used in connection with the grinding basin or plate takes a variety of forms dependent largely on local conditions. Roundish boulders, being plentiful,

were utilized in many cases. Typical artificial forms, however, are not uncommon. Doctor Reynolds obtained a fine cylindrical specimen sixteen inches long and two inches in diameter, with rounded ends. A partially finished example shaped from an oblong boulder of quartzite was collected by Mr J. C. Lang. These cylindrical pestles may have been used with the stone mortars, but more probably with wooden ones for pulverizing corn, seeds, dried meat, etc.

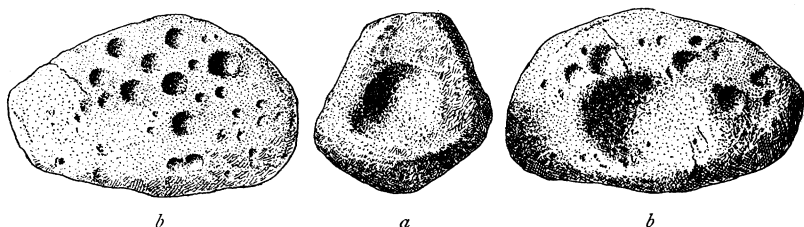


FIG. 15. — *a*, Pitted stone. *b*, Pitted grinding stone (opposite sides).

Pitted stones of small size are occasionally found. Generally they may be classed as hammer-stones, but there are some with deep and rough pits, made of light friable stone (fig. 15, *a*), which would not have been useful as hammers. In some cases there are two or more pits in one side, neither being central. The small mortar made of a boulder (fig. 15, *b*) has upon the surface about the mortar depression six, and on its opposite side eleven, small pits. It is suggested that these may have been used for pulverizing small quantities of paint or other material, for hammer-

ing out metal, for cracking nuts, or as sockets for spindles, but it seems advisable for the present to classify them, so far as the pittings are concerned, with the problematical objects.

Numerous hammer-stones are found associated with the midden refuse. They are pebbles or small boulders of suitable shape, usually ovoid, which have assumed a somewhat discoidal form by continued use in the manufacture of stone implements (fig. 16, *a*). In some cases slight depressions have been pecked in the sides

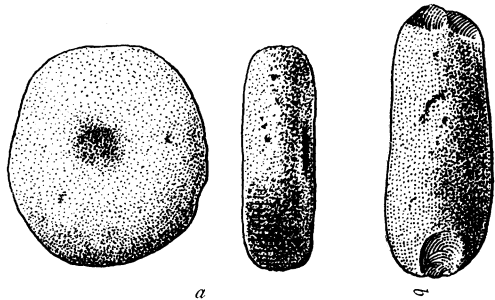


FIG. 16. — Hammer-stones.

of the implements to facilitate their use. Other hammer-like implements are somewhat oblong boulders of medium or small size, which are battered at the ends as if in rough usage (fig. 16, *b*).

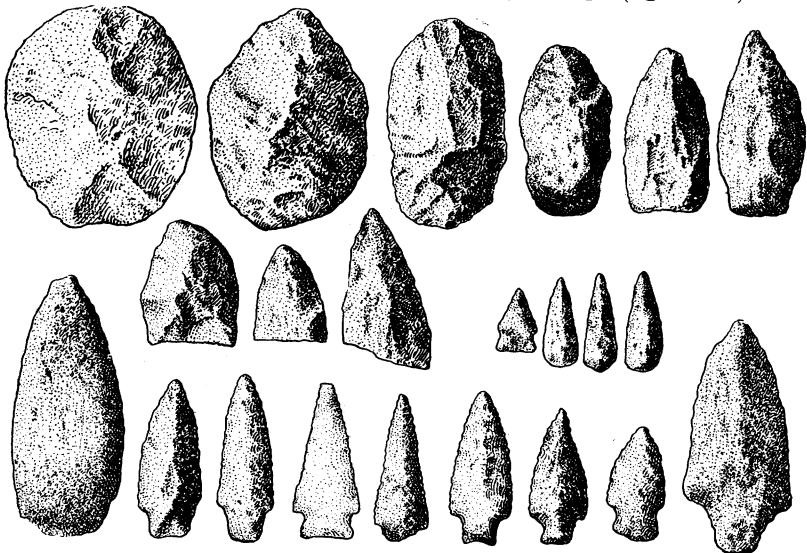


FIG. 17. — Arrow and spear heads, knives, and typical rejecta of manufacture.

Many arrow-heads, spear-heads, and knives of the usual forms, made almost exclusively of quartz and quartzite, are found upon

and in the shell banks and in the fields surrounding them. The materials used in their manufacture are plentiful about the site, and considerable shop refuse is found, especially surrounding the marginal lodge sites on the upper levels. Figure 17 includes the various minor flaked objects common on this site.

Probably the most numerous class of implements are bowlders, generally of oblong flattish contour, which have been given rude



FIG. 18. — Sharpened bowlders, with and without notches.

edges by the removal of a few flakes from one end (fig. 18, *a*). These are common on ancient inhabited sites over the entire Chesapeake-Potomac region. They may have served as axes and

hatchets in cutting wood, in carving dug-out canoes, in breaking the bones of large animals, etc. They are in cases so much blunted by use as to be classed as hammers (fig. 18, *b*). Many, however, show little or no trace of wear — a condition that may result from the fact that suitable bowlders for the shaping of these tools are plentiful all along the face of the bluffs and on the river banks below, and that when an implement was needed, it was quickly improvised, and, after serving the immediate purpose, abandoned.

The sharpened bowlders referred to above grade into another class of tools, made of bowlders of medium size, which, besides the rude flaked edge, have shallow notches broken in the sides, evidently to facilitate hafting (fig. 18, *c*). Doubtless these should be classed as axes.

Implements and ornaments of polished stone are not numerous on this site, and such as have been added to our collections do not differ in any important particular from those of the surrounding country. Examples are illustrated in figure 19.

The pottery made and used by the Popes Creek people was of somewhat rude construction and consisted principally of large sized pots or caldrons with wide mouths and bluntly pointed bases (fig. 20, *a*). These vessels are such as would have served in cook-

ing the oysters and fish which constituted the principal food supply of the natives. They are made of a coarse shell-tempered paste, have thick walls, and very generally show net impressions on the

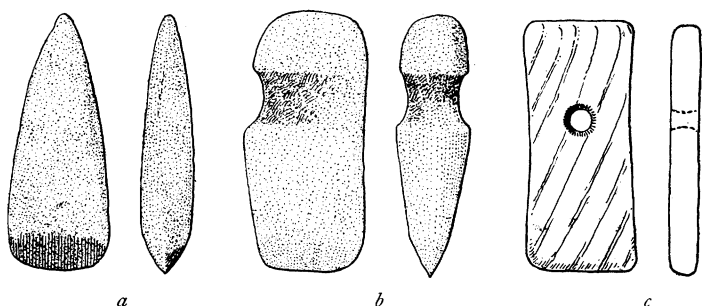


FIG. 19. — Polished implements and pierced ornament.

surface (fig. 20, *b*). In cases, bands of very simple and incised designs are carried around the vessel beneath the rim. The type is characteristic of the shell middens from the Yadkin valley on the south to the Hudson on the north.¹

A number of bone implements were obtained from the shell deposits, including awls made of the bones of birds or small mammals, and a single object, perhaps a pendant, having a perforation at the wider end, ornamented with a number of notches on the margins.

During the progress of the removal of the shells on the lower terrace a number of skeletons were encountered, but no observations were made regarding the manner of burial. No cemeteries have been located, and it is probable that burials here, as at many other points in the general region, were collective, the bodies, or the bones simply, being kept for burial in ossuaries at stated periods.

Although the Popes Creek site is situated within a few miles of the upper limit of the oyster-bearing shores—the point at which the water becomes too fresh for their support—it was, no doubt, in a way the Mecca of the peoples from more northerly localities who had learned to appreciate the oyster as a means of sustenance. The great bulk of the refuse may thus in a measure be

¹ For a detailed description of the Popes Creek pottery, with illustrations, see Holmes in *Twentieth Annual Report of the Bureau of American Ethnology*.

accounted for. But it is observed that deposits of almost equal importance occur along the salt-water shores of the Chesapeake and all of its main tributaries, and one can hardly make a landing be-

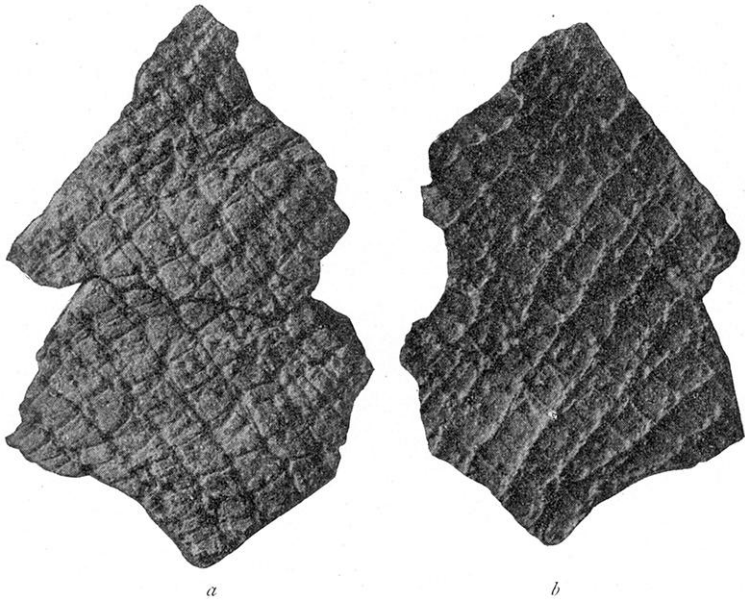


FIG. 20. — *a*, Fragment of pottery with net impressions. *b*, Clay impression from pottery fragment showing net. ($\frac{3}{4}$)

tween Richmond and Havre de Grace without encountering middens composed largely of oyster shells, or the sites from which they have been removed in recent years.

BUREAU OF AMERICAN ETHNOLOGY,
WASHINGTON, D. C.